When rubella occurs in a pregnant woman it can result in fetal death, premature delivery, or a constellation of birth defects known as congenital rubella syndrome (CRS). Rubella and CRS have been nearly eliminated in the United States. However, most crew members on cruise ships which dock at US ports are from developing countries which do not routinely vaccinate against rubella. Rubella outbreaks have occurred among crew members, potentially putting at risk pregnant crew members and passengers.
**OBJECTIVE:** To compare the costs of two interventions: screen all crew members and vaccinate those found to be susceptible to rubella versus vaccinate all crew members.
**METHODS:** A decision tree was created to compare the two options. We used estimates of US private sector costs for MMR vaccine, screening tests and costs of treating adverse reactions. Data on susceptibility rates, and the probabilities of adverse events were used in the model.
**RESULTS:** The model showed that it would cost $28 per crew member to screen first and then vaccinate susceptible crew members versus $27 per crew member to vaccinate all crew members without screening. The three most important variables in this analysis were the cost of the vaccine, the cost of the screening test, and the rubella susceptibility rate of the crew members.
**CONCLUSION:** Using US costs, it is cheaper for cruise lines to vaccinate all employees, rather than screen and vaccinate only those who are susceptible. This model can be modified for different cruise lines with specific susceptibility rates and for vaccines which cruise lines may consider administering to employees, such as varicella and influenza vaccines.

## COMPLIANCE PROGRAMS

TPCP1

### THE ROLE OF COMPLIANCE IN THERAPY CHANGES AMONG NEWLY DIAGNOSED DIABETIC PATIENTS

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Therapy compliance is critical to the successful control of diabetes. Poor control of diabetes often results in changes in therapy, including switching to another agent or addition of concomitant therapy.
**OBJECTIVE:** The primary purpose of this study was to determine whether compliance influenced the likelihood of changes in diabetic therapy among newly diagnosed diabetic patients.
**METHODS:** Pharmacy claims data were used to identify newly diagnosed diabetic patients and evaluate compliance from January 1995 through June 1997. Newly diagnosed diabetics were identified as those having a prescription claim for an oral hypoglycemic agent in January 1996 with no diabetic claim in the previous 12 months. Switching was identified as change to another oral hypoglycemic agent. Concomitant was defined as those patients who had additional therapy added to their monotherapy regimen. Cox proportional hazards was used to estimate the influence of compliance on the likelihood of changes in therapy controlling for patient age, gender, and oral hypoglycemic agent.
**RESULTS:** The results suggest that those patients who are more compliant are more likely to have concomitant therapy added to their regimen (OR = 1.69; 95% CI 1.60–1.79) compared to those least compliant. The opposite relationship was found for switching where those most compliant were 22–38% less likely to switch therapy compared to the least compliant group.
**CONCLUSIONS:** Compliance does play a role in changes to therapy among diabetic patients. Disease severity may play a role in explaining the results found. For those patients who had additional therapy added to their regimen, it appears that in spite of their good compliance, their disease was not being controlled appropriately resulting in the addition of concomitant therapy.

TPCP2

### PERCENTAGE OF ANTI-HYPERTENSIVE DRUGS "FILLED AS INTENDED" COMPARING PHARMACY CLAIMS AND MEDICAL RECORDS DATA

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**OBJECTIVE:** The aim of this study was to determine the percentage of anti-hypertensive drugs documented in medical records that appeared in managed care pharmacy claims.
**METHODS:** Study subjects were incident hypertensive patients identified by: 1) at least one claim with an ICD-9 diagnosis code of hypertension and at least one claim for an anti-hypertensive drug; or 2) at least two claims with an ICD-9 diagnosis code of hypertension, preceded by a 6-month treatment-free period. Nurse abstractors reviewed medical records for newly initiated or continuing anti-hypertensive drugs (ACE inhibitors, angiotensin II receptor blockers, beta-blockers, calcium channel blockers, and diuretics). To determine whether these drugs were filled, we reviewed pharmacy claims for a 12-month period after the subject's initial anti-hypertensive drug claim. Drugs were "filled as intended" if a pharmacy claim for the same drug was identified, and filled within 7 days prior to, or 30 days after, the date of the notation in medical records.
**RESULTS:** Medical records were abstracted for 563 patients, with 2205 notations of newly initiated or continuing anti-hypertensive drugs. Of these, 1209 (54.8%) pharmacy claims had fill dates that appeared to have been "filled as intended." The median "days supplied" for these fills was 30 days, with a mode of 30 days.
**CONCLUSION:** In this population, 54.8% of anti-hypertensive drugs noted in medical records appeared to have been "filled as intended" based on pharmacy claims data. Given a median of 30 "days supplied" for anti-hyperten-

sive drugs, patients would be expected to have filled medications documented in medical records within the "filled as intended" time frame. This simple analysis further illustrates that patients frequently do not comply with medication taking for chronic, asymptomatic conditions.

**TPCP3**

## PATIENT COMPLIANCE, QUALITY OF LIFE, AND SATISFACTION AFTER INTENSIVE OUTPATIENT COUNSELING

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**OBJECTIVE:** The purpose of this study was to determine the impact on quality of life, level of compliance and satisfaction with services after pharmacist outpatient counseling and monitoring.
**METHOD:** The study is a prospective examination of hypertensive patients over 64 years old. The control group (N = 160) received standard drug counseling on receiving new medication. The treatment group (N = 144) received extensive drug education and monthly follow-up calls for reassessment and to reinforcing compliance. The patients filled out health status surveys at the start of the study ($T_0$), in 6 months ($T_1$) and 12 months later ($T_2$). The survey instruments included Pharmacy Services satisfaction, the Morisky Compliance Scale, medication awareness, smoking, liquor, Likert Scale self-assessment of global health (0–100 in 10-unit decrements), SF-36, HUI Mark 2, and the Hypertension/Lipid TyPE Survey.
**RESULTS:** The groups were compared to each other at $T_0$ and $T_2$, and compared to themselves from $T_0$ to $T_2$. The difference between groups in Morisky Score and Likert Scale was not significant and neither group had significant changes. At $T_2$ the treatment group had a higher SF-36 RE score than the control group, 79.06 versus 67.42 ($p < 0.05$) while other scales showed no significant differences between groups or changes over time. The difference between groups in HUI attributes or utility score was not significant and neither group had significant changes.
**CONCLUSION:** Patient counseling does not appear to enhance compliance in this population. QoL scores indicate some emotional benefit, possibly due to ongoing pharmacist contact. Other measures in this population suggest no impact on overall level of health based on outpatient counseling.

**TPCP4**

## DISCRETE CHOICE MODELING ON PATIENT PERCEIVED COMPLIANCE: ANALYSIS OF PATIENT'S HEALTH BELIEF PERSPECTIVE

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Patient compliance with their medication regimen is essential for the success of their medical therapy, especially in the treatment of chronic illnesses.
**OBJECTIVE:** The purpose of the present study is to identify factors that influence patient perceived compliance in accordance to patient's health belief perspective.
**METHOD:** This study employed a stratified random sample of 7000 patients from southern California, served by a large health maintenance organization (Kaiser Permanente). The dependent variable was derived from a well-validated self-reported (Morisky) scale for patient adherence in medication regimen. First a restrictive binary choice logistic model was made where patients were differentiated on basis of their compliance or noncompliance. Next, patient's compliance behavior was categorized as High, Medium, or Low, and an ordered probit model was employed. Patient's socioeconomic status, comorbidities, prescription utilization pattern were used as explanatory variables.
**RESULTS:** The study sample consisted of patients 34 to 82 years of age (mean = 50). Both restrictive and relaxed models showed that likelihood of poor or medium compliance significantly ($p < 0.0001$) increased with age. Female patients, African Americans, and employed persons were likely to have more compliant behavior. Patient health behaviors (smoking, drinking) or education did not show any significant contribution to prediction. Patients with high physical or mental SF-36 component scores and fewer chronic diseases were found poorly compliant. Model fit was evaluated by adjusted generalized $R^2$ (0.1348) as well as by ROC curves (sensitivity [25.7%] and specificity [99.5%]).
**CONCLUSION:** Findings of this study reconfirmed the usefulness of the health belief model in determining factors affecting compliance.

**TPCP5**

## THE COST OF DISCONTINUATION OF ANTI-HYPERTENSIVE DRUG THERAPY IN A MEDICAID POPULATION

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The majority of diagnosed hypertensive patients receive drug therapy in addition to recommended lifestyle changes. One of the major barriers to the management of hypertension is the interruption or premature termination of therapy.
**OBJECTIVE:** To estimate the prevalence of, and healthcare costs associated with, the discontinuation of anti-hypertensive drug therapy in a Medi-Cal population.
**METHODS:** The Medi-Cal paid claims data were used to identify patients with at least one anti-hypertensive prescription. The date of this first prescription was used to partition the patient's stream of paid claims into pre- and post-time periods of 6 and 12 months, respectively.